

SOUTHWEST FISHERIES CENTER

NATIONAL MARINE FISHERIES SERVICE

SOUTHWEST FISHERIES CENTER

P.O. BOX 271

LA JOLLA, CA 92038

FEBRUARY 1988

DOCUMENTATION FOR THE WEST COAST FISHING FLEET COST-EARNINGS DATA BASE

By

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ADMINISTRATIVE REPORT LJ-88-04

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I. INTRODUCTION

The West Coast Fishing Fleet Cost-Earnings Data Base (CEDB) was created to consolidate fishing vessel cost and earnings data into an informational and analytical data base that would support economic research and provide economic information on selected U.S., west coast fisheries.

The major source of landings and ex-vessel earnings data for west coast fishing vessels is the PACFIN Research Data Base which contains annual fish ticket and vessel registration data: landings, ex-vessel prices, and fishing vessel characteristics data for Washington, Oregon and California vessels for the years 1981 through 1985 (Jacobson and Huppert 1986). Because of its design, comprehensiveness, continuity, and the level of support provided users, the PACFIN data base has experienced widespread popularity among researchers investigating and monitoring changes in the fishing activities and gross earnings of various west coast fleets over time.

Fishing vessel cost data, on the other hand, are typically assembled on an ad hoc basis. There is nothing for vessel costs that incorporates the annual, secondary data reporting and compilation mechanisms that constitute the PACFIN Research Data Base. Instead, cost data are usually collected as part of a specific study and are therefore subject to the special needs and

concerns of the investigator. Because a routine, standard cost data reporting format is lacking, it is difficult to use these data to conduct consistent, or routine analyses (e.g. fleet productivity analyses) which draw on both the PACFIN and various vessel cost data bases.

In view of the disparate nature of fishing vessel cost data, we set out to establish an economic information and research data base, comprising both fishing vessel cost and earnings data, which would feature the versatility and permanence that characterizes the PACFIN data base. In this report, we document that effort by first providing an overview of the CEDB in terms of the elements it comprises, their source, and concerns about confidentiality and access. We next describe in detail the structure and content of the CEDB system, and in the last section present statistical summaries for the quantitative variables in the data base.

II. OVERVIEW

A. Data Description

There are costs associated with operating and owning a fishing vessel. Costs related to the vessel's operation are generally categorized as variable costs, since they vary with the level of fishing activity. Ownership costs tend to be incurred whether or not the vessel actually engages in fishing (or non-fishing activities), and therefore fall into a fixed cost category. Vessels generate earnings from the sale of fish

caught, or by engaging in alternative revenue-producing activities. For over 100 vessels that belonged to either the west coast trawl fleet, or the U.S. tropical tuna purse seine fleet, or the southern California gillnet fleet, in one or more of the years 1981-86, we acquired data on annual expenditures for major items of both variable and fixed cost, and annual earnings by fishing and non-fishing activities. Petroleum (fuel and lubricants), wages and benefits, maintenance, and expenditures on a number of other intermediate inputs were the major items of variable cost. Interest, mortgage, depreciation, insurance, administrative, professional, and other overhead, were the major fixed expenses. For these items, actual expenditures are further disaggregated and detailed in the next section. In addition to economic data, data on the vessels' physical characteristics were also obtained.

B. Data Sources

The scope of the CEDB is limited by the periodic availability of secondary cost data from individual fishing vessels. In this regard, individual vessel cost and earnings information that could be obtained directly from federal tax forms, through NMFS's fishing vessel Capital Construction Fund (CCF) and Fishing Vessel Obligation Guarantee program (FVOG), provided a starting point for the construction of the data base. We recognized the interpretive problems inherent in data taken from tax forms, but nonetheless feel that these have been sufficiently resolved so that reasonable data on the costs and returns of

owning and operating a fishing vessel have been entered into the CEDB.

For west coast vessels, cost and earnings data taken from tax forms were supplemented with corresponding PACFIN data on landings and revenue by species, as well as physical characteristics data, to thoroughly document a particular vessel's economic performance on an annual basis.

C. Confidentiality

Standard provisions for access to confidential data apply to the Cost-Earnings Data Base. Access is restricted in accordance with the data sharing agreement with the state of California. Potential users must sign a confidentiality agreement before accessing the data.

D. Who to Contact for More Information

Responsibility for the maintenance and continuance of the West Coast Fishing Fleet Cost-Earnings Data Base rests with Dr. Samuel F. Herrick, Jr. and Dr. Dale Squires of the Southwest Fisheries Center, La Jolla. Their address and respective phone numbers follow:

National Marine Fisheries Service
Southwest Fisheries Center
P.O. Box 271
La Jolla, CA 92038

619/546-7111, FTS/893-7111

619/546-7113, FTS/893-7113

III. DESCRIPTION OF THE SYSTEM

A. Data Base Design

The West Coast Fishing Fleet Cost-Earnings Data Base has been implemented on a COMPAQ portable computer, running the MS-DOS operating system. Fleet-specific data files were created using the relational data base structure and data management system provided by dBASE III. The intent was to establish a highly flexible structure that could be easily modified to accept "nonstandard" data (i.e., data not from tax forms or the PACFIN). The dBASE III system satisfies these requirements, and also allows for report generation, data manipulation using an internal programming capability, and automated data entry.

B. Data Base Structure

The database contains three separate files for: (1) the west coast groundfish/shrimp trawl fleet, (2) the southern California swordfish/shark drift gillnet fleet, and (3) the U.S. tropical tuna purse seine fleet. The respective files are called TRAFILT.DBF, TUNAS.DBF, and GILLS.DBF. TRAFILT.DBF contains 82 fields, 171 vessel-years, 74 vessels and takes up 123,392 bytes. TUNAS.DBF contains 82 fields, 40 vessel/corporation years, 15 vessels, and takes up 30890 bytes. GILLS.DBF contains 82 fields, 39 vessel-years, 12 vessels, and takes up 29480 bytes. Each fleet file contains a separate record for each vessel in that fleet, for each year in which cost-earnings data were available for that vessel. Each record contains the information shown in table 1.

Table 1. dBASE III+ FORMAT OF DATA BASE

Data Element	Name	Format	Description	Source
1	ID	Numeric	6 digit Coast Guard ID #	CCF tax
2	VES_NAME	Character	Name of Vessel	CCF tax
3	YEAR	Numeric	Calendar year for which cost-earnings data applies	CCF tax
4	HOMEPORT	Character	Principle port of vessel which account for a plurality of revenues	PACFIN
5	LENGTH	Numeric	Coast Guard measurement in feet.	PACFIN
6	GROSSTON	Numeric	Coast Guard registered tonnage	PACFIN
7	HORSEPOWER	Numeric	Coast Guard registered horsepower	PACFIN
8	CREWSIZE	Numeric	Number in crew	PACFIN
9	YEARBUILT	Numeric	Construction year of vessel	CCF tax
10	YEARPURCH	Numeric	Purchase year of vessel	CCF tax
11	LANDINGS	Numeric	Number of fish tickets	PACFIN
12	WEEKS	Numeric	Weeks fished in year	PACFIN
13	GEARTYPE	Numeric	Code to indicate type of fishing gear used	CCF tax
14	JV	Numeric	Joint Venture operations dummy variable; 1=JV 0=not	OTHER
15	OTHER_CAP	Numeric	Costs listed as other capital expenses	CCF tax
16	DEPTOTAL	Numeric	Vessel depreciation for year	CCF tax
17	PETROCOST	Numeric	Vessel fuel cost	CCF tax
18	PROVISCOST	Numeric	Cost of vessel provisions	CCF tax

Data Element	Name	Format	Description	Source
19	GEARCOST	Numeric	Cost of vessel gear	CCF tax
20	CREWCOST	Numeric	Crew expenses including crewshare and captain's share	CCF tax
21	OTHERCOST	Numeric	Other costs related to crew - employee benefits, retirement, etc.	CCF tax
22	TAX	Numeric	Local, state, and federal taxes. Does not include income taxes.	CCF tax
23	AUTOEXPENS	Numeric	Costs related to automobiles	CCF tax
24	REPAIRCOST	Numeric	Repair expenses	CCF tax
25	MAINTENENC	Numeric	Vessel maintenance expenses	CCF tax
26	DUES	Numeric	Membership costs	CCF tax
27	BAITCOST	Numeric	Costs for bait	CCF tax
28	ICECOST	Numeric	Costs for ice	CCF tax
29	SALTCOST	Numeric	Costs for salt	CCF tax
30	PERMITCOST	Numeric	Cost of fishing permit or license	CCF tax
31	EQUIPCOST	Numeric	Costs related to equipment	CCF tax
32	OFFLOADEXP	Numeric	Offloading costs	CCF tax
33	HAULOUTEXP	Numeric	Haulout costs including launching and storage	CCF tax
34	RENTETC	Numeric	Expenses listed as rent, lease, moorage	CCF tax
35	INSURCOST	Numeric	Insurance expenses	CCF tax
36	MORTGAGEEX	Numeric	Mortgage costs	CCF tax
37	INTERESTEX	Numeric	Costs of interest	CCF tax

Data Element	Name	Format	Description	Source
38	PROEXP	Numeric	Professional fees including management accounting and legal	CCF tax
39	TRAVELEXP	Numeric	Costs of travel	CCF tax
40	SUPPLYEXP	Numeric	Items listed as supplies not as provisions	CCF tax
41	OFFICEEXP	Numeric	Office expenses	CCF tax
42	PHONEEXP	Numeric	Phone or utilities expenses	CCF tax
43	BANKCHARGE	Numeric	Bank charges including special loan guarantee program fees	CCF tax
44	CCFDEPOSIT	Numeric	Capital Construction Fund deposit	CCF tax
45	FREIGHTEXP	Numeric	Freight costs	CCF tax
46	OTHEREXP	Numeric	Misc. vessel expenses	CCF tax
47	TOTALEXP	Numeric	Total deductions or total deductions plus costs of goods sold, those items listed as totals	CCF tax
48	OWNERPAY	Numeric	Payments to the owners of the vessel such as partners and corporate officers	CCF tax
49	DEPNEGATIV	Numeric	Negative depreciation expense due to CCF deposit	CCF tax
50	FUELPRICE	Numeric	Price of fuel (No.2 marine diesel)	OTHER
51	OPPLABOR	Numeric	Opportunity cost of labor	OTHER
52	CAPSERV	Numeric	Capital services price	OTHER
53	TOTALREV	Numeric	PACFIN reported total revenue	PACFIN

Data Element	Name	Format	Description	Source
54	TOTREV	Numeric	Tax form reported total revenue	CCF tax
55	JVREV	Numeric	Computed joint venture revenue	OTHER
56	TR_SP1	Numeric	Total revenue species1	PACFIN
57	TR_SP2	Numeric	Total revenue species2	PACFIN
58	TR_SP3	Numeric	Total revenue species3	PACFIN
59	TR_SP4	Numeric	Total revenue species4	PACFIN
60	TR_SP5	Numeric	Total revenue species5	PACFIN
61	TR_SP6	Numeric	Total revenue species6	PACFIN
62	TR_SP7	Numeric	Total revenue species7	PACFIN
63	TR_SP8	Numeric	Total revenue species8	PACFIN
64	TR_SP9	Numeric	Total revenue species9	PACFIN
65	TR_SP10	Numeric	Total revenue species10	PACFIN
66	JVTONS	Numeric	Computed joint venture catch in tons	OTHER
67	TOTCATCH	Numeric	Total catch in tons	PACFIN
68	TC_SP1	Numeric	Total catch species1	PACFIN
69	TC_SP2	Numeric	Total catch species2	PACFIN
70	TC_SP3	Numeric	Total catch species3	PACFIN
71	TC_SP4	Numeric	Total catch species4	PACFIN
72	TC_SP5	Numeric	Total catch species5	PACFIN
73	TC_SP6	Numeric	Total catch species6	PACFIN
74	TC_SP7	Numeric	Total catch species7	PACFIN
75	TC_SP8	Numeric	Total catch species8	PACFIN
76	TC_SP9	Numeric	Total catch species9	PACFIN

Data Element	Name	Format	Description	Source
77	TC_SP10	Numeric	Total catch species10	PACFIN
78	DATAFORM	Numeric	Tax form used	CCF tax
79	YEARTYPE	Numeric	Type of year	CCF tax
80	MEMO	Character	Any necessary information listed as comments	OTHER
81	PRICE	Numeric	Vessel acquisition price	CCF tax
82	OPP_CAP	Numeric	Opportunity cost of capital	OTHER

See page 16 for species codes

All costs and revenues in data base are in nominal dollars.

Data Source Codes

CCF tax data: Tax data from vessels participating in the
Capital Construction Fund

PACFIN: Data transferred directly from the PACFIN
Research Data Base

OTHER: listed below

JV. Personnel at National Marine Fisheries
Service, Southwest Region monitor joint
venture participation by west coast trawl
vessels. Vessels in the cost-earnings trawl
fleet were identified accordingly.

FUELPRICE. Average of quarterly fuel prices obtained
from vessel principle ports.

OPP_LABOR. Opportunity cost of labor by homeport. Labor
earnings information from the Bureau of Labor
statistics was used to calculate the next best

alternate income source for crew members in their principle area. The geometric mean for three labor categories, captain, mechanic, and crew, was used as opportunity cost.

OPP_CAP. Opportunity cost of capital = vessel acquisition price * interest rate, where interest rate = Baa bond rate.

CAP_SERV. Capital services price = (Vessel acquisition price * depreciation rate) + opportunity cost of capital, where depreciation rate = 7% annually.

JV_REV. Joint venture revenue. This variable was computed taking tons caught by the vessel as listed in the JV log books, and multiplying it by a coastwide average price per ton of Pacific Whiting, compiled by the National Marine Fisheries Service, Southwest Region.

C. Missing Values

As the cost categories in the database are very specific, and in some instances somewhat alike, some fields hold aggregated information (due to tax form accounting). In such cases, a MEMO field, v81, has been added to indicate the various aggregations. Those fields with missing values, have been assigned (-1) as a missing value.

IV. SUMMARY STATISTICS

A. Data Integrity.

The integrity of the cost data was checked by measuring the difference between the observed share of annual total variable/fixed costs for each of the vessel's itemized costs and the corresponding mean cost shares for all vessels in the cost-earnings fleet, i.e.,

$$C_{i,j}/TC_j - \sum_{j=1}^n (C_{i,j}/TC_j)/N$$

Where $C_{i,j}$ = expenditure on cost item i for vessel j and

TC_j = total expenditure by vessel j .

Using a two standard deviation difference rule (actual minus fleet mean $> < 2$ std deviations from fleet mean), none of the reported cost values were considered to be outliers. PACFIN revenue is checked for integrity as it is introduced into the PACFIN data base. The integrity of the cost data was also checked by comparing the percentage deviation of the total revenue from PACFIN and the total revenue from fishing firm income tax returns. Reasons for deviations greater than 15% were further examined. In this way, vessels fishing in Alaska for part of the year, having incomplete PACFIN data, could be distinguished. These vessels were deleted from the Trawler data file.

All statistical summaries and data integrity checking were done using Statistical Package for the Social Sciences (SPSS/PC+). The statistical summaries are listed at the end of this document.

B. Statistical Results

For purposes of completing summary statistics the following aggregations were performed. All summary cost values were converted to 82 dollars.

TOTAL VARIABLE COST = PETROCOST + PROVISCOST + GEARCOST +
OTHERCOST + TAX + AUTOEXPENS + REPAIRCOST +
MAINTENENC + DUES + BAITCOST + ICECOST +
SALTCOST + PERMITCOST + EQIPCOST +
OFFLOADEXP + RENTETC + SUPPLYEXP +
FREIGHTEXP.

TOTAL FIXED COST = HAULOUTEXP + INSURCOST + PROEXP + TRAVELEXP +
OFFICEEXP + PHONEEXP + BANKCHARGE.

TOTAL COST = TOTAL VARIABLE COST + TOTAL FIXED COST.

Table 2. Summary Statistics for West Coast Trawl Vessels

a) Trawlers length less than 50 feet

Variable	Mean	Max	Min	Median	Std. Dev.
Total Variable Cost	87236	417507	71.6	74054	63491.7
Total Fixed Cost	14019	87687.5	2131	11581	13813.0
Length(ft.)	43.39	49.00	0.00	49.00	14.15
Gross ton	39.07	58.00	0.00	44.00	16.27
Horsepower	220.76	375.00	0.00	273.00	133.17
Crew size	2.256	3.000	0.00	2.000	.875
Year purchased	77.68	82	69	78	2.858
Landings(tons)	36.42	101.00	0.0	39.00	24.68
Weeks fished	24.39	46.00	0.0	28.00	13.85

b) Trawlers of length between 50-75 feet

Variable	Mean	Max	Min	Median	Std. Dev.
Total Variable Cost	129113	496710	6035.24	94058.38	101500.06
Total Fixed Cost	14941.21	54036.26	0.00	13858.50	8835.92
Length(ft.)	61.64	73.00	50.00	62.00	6.218
Gross ton	80.96	141.00	0.0	85.50	29.148
Horsepower	326.91	840.00	0.0	335.00	167.78
Crew size	3.05	4.00	2.00	3.00	.597
Year purchased	73.17	85	0.0	79	18.88
Landings(tons)	45.04	234.00	0.0	42.00	29.96
Weeks fished	33.02	52.00	0.0	34.00	9.19

c)Trawl vessels of length greater than 75

Variable	Mean	Max	Min	Median	Std. Dev.
Total Variable Cost	172799.8	278178.5	86842.2	174889.7	56042.56
Total Fixed Cost	17533.63	43319.55	6705.89	16408.5	9602.12
Length(ft.)	81.83	97.00	76.00	77.50	8.42
Gross ton	133.41	194.00	90.00	135.00	34.39
Horsepower	477.91	880.00	400.00	425.00	131.35
Crew size	3.25	5.00	2.00	3.00	1.05
Year purchased	58.16	80	0.0	79	35.18
Landings(tons)	38.25	65.00	17.00	38.50	14.82
Weeks fished	29.67	36.00	18.00	30.00	6.035

Table 3. Summary Statistics for West Coast Tuna Seiners

Variable	Mean	Max	Min	Median	Std. Dev
Total Variable Cost	726085.4	1721718	0.0	6333549.3	563589.6
Total Fixed Cost	109599.5	222882.9	0.0	115485.42	73702.27
Landings(tons)	10.47	29.00	1.0	8.00	8.36
Weeks fished	7.118	26.00	1.00	4.00	7.68
Length(ft.)	129.1	194.00	45.00	136.00	47.13

Table 4. Summary Statistics for West Coast Gillnet Fleet

Variable	Mean	Max	Min	Median	Std. Dev
Total Variable Cost	39001.3	174546.4	2204.12	33971.50	34471.73
Total Fixed Cost	4870.15	20210.90	70.30	4103.42	4373.78
Landings(tons)	28.23	77.00	3.00	24.00	19.21
Weeks	19.67	36.00	3.00	18.00	8.890
Length(ft.)	40.10	64.00	26.00	38.00	11.08

V. VARIABLE CODES

Definition of Homeport codes

A. Oregon

AST Astoria	COS Coos Bay	NEW Newport
BRK Brookings	TLL Tillamook Bay	FLR Florence
DES Deschutes	CSC Coos	CUR Curry
CRK Crook	KLM Klamath	MLR Malheur
MRN Marion	MRW Morrow	TLC Tillamook

B. Washington

BLN Blaine	BLL Bellingham	ANA Anacortes
EVR Everett	TAC Tacoma	SEA Seattle
OLY Olympia	NEA Neah Bay	WPT Westport
CPL Copalis	PAG Port Angeles	WLB Bay Center
LWC Chinook		

C. California

ALB Albion	AVL Avila	BDG Bodega Bay
BRG Fort Bragg	CRS Crescent City	CRZ Santa Cruz
ERK Eureka	MNT Monterey	MOS Moss Landing
MRO Morro Bay	NWB Newport Beach	OAK Oakland
TML Tomales Bay	TRM Terminal Is.	TRN Trinidad
WLN Wilmington	SB Santa Barbara	SD San Diego
OBV Ventura		

Definition of gear codes

TRAWL FLEET
(not reported)

TUNA FLEET
1 - Purse
 seine
2 - Other

GILLNET FLEET
1 - Drift
 gillnet
2 - Set
 gillnet
3 - Troll
4 - Hook & line
5 - Gillnet

Definition of species codes

TRAWL FLEET

sp1) Salmon
sp2) Dover
sp3) Flatfish
sp4) Rockfish
sp5) Cod & Lingcod
sp6) Sable
sp7) Whiting
sp8) Shrimp
sp9) Crab
sp10) Misc.

TUNA FLEET

sp1) Yellowfin
sp2) Skipjack
sp3) Bluefin
sp4) Albacore
sp5) Unspecified
sp6) Other
sp7) Black skipjack
sp8) Pacific bonito
sp9) Swordfish
sp10) Other

GILLNET FLEET

sp1) Albacore
sp2) Mackerel
sp3) Swordfish
sp4) Rockfish
sp5) Thresher
sp6) Halibut
sp7) Mako
sp8) Seabass
sp9) Lobster
sp10) Other

